



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,052	06/14/2006	Peter Dytrych	NL03 1445 US1	8831
65913	7590	09/24/2008	EXAMINER	
NXP, B.V. NXP INTELLECTUAL PROPERTY DEPARTMENT M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131			FAHERTY, COREY S	
			ART UNIT	PAPER NUMBER
			2183	
			NOTIFICATION DATE	DELIVERY MODE
			09/24/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No. 10/583,052	Applicant(s) DYTRYCH, PETER	
	Examiner Corey S. Faherty	Art Unit 2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,6-10 and 12-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6-10 and 12-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the reply filed on 07/10/2008.
2. Claims 1-3, 6-10 and 12-17 are pending in the application and have been examined.
3. The objection to claim 7 made in the previous office action is withdrawn.
4. The amendment filed 07/10/2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: “computer readable medium” in claim 13.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

5. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), *at the time the application was filed*, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: “computer readable medium” in claim 13.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Art Unit: 2183

7. Claims 1-3, 6-10 and 13-15 are rejected under 35 U.S.C. 101 because they are directed to non-statutory subject matter. There is evidence in the specification [page 10, lines 3-16] that claims include a software-only embodiment. Because computer software is an abstract idea, it does not fall into a statutory category of invention, and the claims therefore fail to meet the requirements of 35 U.S.C. 101. Applicant has argued that the presently recited claims include statutory subject matter. However, given the evidence in the specification, all elements of the claims can be interpreted as software-only and the claims are therefore not statutory. To overcome this rejection, an explicit reference to a “hardware” structure should be added to the claims.

8. Claim 13 is rejected under 35 U.S.C. 101 for being directed to non-statutory subject matter. There is evidence in the specification [page 10, lines 7-9] that the claim is directed to an electro-magnetic signal which does not fall into a statutory category of invention.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 2183

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 1-3, 6-7, 10 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (EP 1 046 983) in view of Faraboschi et al. (U.S. Patent 5,930,508), referenced from here forward as Faraboschi.

12. Regarding claims 1, 12 and 15, Suzuki discloses a parallel processing apparatus for processing data based on instruction words comprising at least two individual instructions used for controlling at least two respective functional units, [page 6, paragraph 0039; a processor contains at least two processing units, each of which processes an instruction of a very long instruction word], said apparatus comprising:

an instruction processor arranged to process a first individual instruction extracted from a first instruction word, and at least a second individual instruction extracted from at least a subsequent second instruction word, as a new single instruction word [pages 6-7; paragraphs 0043-0048; instructions are compressed by combining individual instructions from multiple instruction words]; and

a program memory arranged to store said single instruction word [page 8, paragraph 0061; the compressed instruction is stored in a memory].

Suzuki does not explicitly disclose that the processor is further arranged to add a predetermined control information to said single instruction word, said control information indicating an allocation of said extracted first and at least second individual instructions to said respective functional units and a sequential order of said first and least second individual instructions at their respective functional units.

However, Faraboschi discloses an instruction compression technique similar to that of Suzuki in which nops are removed from the original instruction words and the remaining instructions are combined [col. 2, line 66 – col. 3, line 15]. In the system of Faraboschi, the processing means is arranged to add a predetermined control information to the compressed instruction word [col. 4, line 57 – col. 5, line 35], said control information indicating at least one of an allocation of said extracted first and at least second individual instructions to said respective functional units [col. 4, lines 65-66] and a sequential order of said first and least second individual instructions at their respective functional units [col. 5, lines 12-39].

It would have been obvious to use the compression techniques of Faraboschi in the compression system of Suzuki because doing so allows for more efficient compression and execution of the instructions due to increased opportunity for compression.

13. Regarding claim 2, Suzuki in view of Faraboschi discloses an apparatus according to claim 1, wherein said instruction processing means is arranged to extract said first and at least second individual instructions if said first and at least second instruction words each comprise one of predetermined instruction patterns with at least one delay instruction, and to compress said first and at least second instruction words into said single instruction word [Suzuki, pages 6-7; paragraphs 0043-0048; instructions are compressed when nops exist].

14. Regarding claim 3, Suzuki in view of Faraboschi discloses an apparatus according to claim 2, wherein said delay instruction is a null operation [Suzuki, pages 6-7; paragraphs 0043-0048; instructions are compressed when nops exist].

15. Regarding claims 6 and 16, Suzuki in view of Faraboschi discloses an apparatus according to claim 1, wherein said control information consists of at least one bit added as at

Art Unit: 2183

least one respective most significant bit to said single instruction word [Faraboschi, col. 5, lines 13-35].

16. Regarding claim 7, Suzuki in view of Faraboschi discloses an apparatus according to claim 1, wherein said instruction processing means is arranged to check said control information in an instruction word read from a program memory to re-establish said first and at least instruction words based on said control information, and to supply said re-established first and at least second instruction words to an instruction decoder [Faraboschi, col. 5, lines 13-18].

17. Regarding claim 10, Suzuki in view of Faraboschi discloses an apparatus according to claim 1, wherein said parallel processing apparatus is a VLIW processor [Suzuki, title].

18. Regarding claim 13, Suzuki in view of Faraboschi discloses a computer program product comprising code means for controlling a computer system so as to perform the steps of a compression method according to claim 12 when loaded into said computer system [Suzuki, page 8, paragraph 0061].

19. Regarding claim 14, Suzuki in view of Faraboschi discloses an apparatus according to claim 1, wherein said new single instruction word further includes a third individual instruction extracted from a subsequent third instruction word [Faraboschi, Figures 4,5; a compacted instruction word may include three or more instruction syllables].

20. Regarding claim 17, Suzuki in view of Faraboschi discloses a method according to claim 12, further comprising: reading the stored single instruction word [Faraboschi, col. 5, lines 36-39; the compacted instruction is read]; checking said control information in the read single instruction word [Faraboschi, col. 5, lines 36-39; the delimiter bits are used]; re-establishing said first and at least second instruction words based on said control information [Faraboschi, col. 5,

Art Unit: 2183

lines 36-39; the delimiter bits are used to differentiate the original instructions]; and decoding said re-established first and at least second instruction words [Faraboschi, Fig. 6; col. 5, lines 46-60; instructions are dispersed to be executed].

21. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Faraboschi as applied to claim 1 above, and further in view of Iwata et al. (U.S. Patent 6,275,921), referenced from here forward as Iwata, and Topham (U.S. Patent Application Publication 2001/0047466).

22. Regarding claim 8, Suzuki in view of Faraboschi does not explicitly disclose that all instruction words associated with delay slots and branch targets are marked, wherein extraction of instruction words is based on the markings. However, Suzuki analyzes all instruction types to determine which will be extracted and therefore, in a system having delay slots and branch instructions, it would be obvious to mark those specific types of instructions in order to analyze them for potential extraction. Furthermore, as is well-known in the art, as well as being taught by Iwata [col. 19, lines 15-63] and Topham [page 6, paragraphs 0075-0077], delay slot instructions and target instructions must be executed with their specific basic block and therefore care must be taken when compressing such instructions with other instructions. It therefore would have been obvious to a person having skill in the art to mark these types of instructions and base any compression or extraction of instructions on those markings.

23. Regarding claim 9, Suzuki in view of Faraboschi, Iwata and Topham discloses an apparatus according to claim 8, wherein said instruction processing means is arranged to adjust at least one program memory address based on a decided extraction [Topham, page 1, paragraph 0011].

Response to Arguments

24. Applicant's arguments filed 07/10/2008 have been fully considered but they are not persuasive.

25. Applicant first argues that the proposed combination of Suzuki and Faraboschi would undermine the stated purpose of the Suzuki reference to provide compression without assigning special bits to an instruction field and that there is therefore no reason for one having skill in the art to form the combination. The examiner respectfully disagrees. A person having skill in the art will recognize the benefits of adding the techniques of Faraboschi to Suzuki. The addition of control bits such as taught by Faraboschi allows for more instructions to be compressed because those instructions do not need to meet the same criteria that instructions in the system of Suzuki must meet in order to be compressed. Furthermore, the use of the delimiter encoding bits in Faraboschi allows, for instance, for a compacted instruction word to be stored across address boundaries [col. 6, lines 3-6], resulting in more efficient compression of those instructions. The use of dispersal bits also allows the compacted instructions to be quickly and easily forwarded to the appropriate functional unit without needing to decode the instruction. For at least these reasons, the addition of the techniques of Faraboschi to Suzuki would be obvious to a person having skill in the art.

26. Applicant next argues that the dispersal bits of Faraboschi do not indicate both an allocation of instructions to respective functional units and a sequential order for execution. However, the examiner is not relying on the dispersal bits to teach an indication of the order for

execution. Rather, the delimiter encoding bits [col. 5, lines 12-39] are being used for such a teaching. Applicant's argument is therefore not persuasive.

27. Applicant next argues that the examiner has not provided sufficient information regarding how the compression scheme of Faraboschi is to be implemented in the system of Suzuki. More specifically, applicant argues that the examiner has not specified what portions of Faraboschi should replace what portions of Suzuki. The examiner submits that a person having skill in the art will recognize that it is the addition of the compression techniques of Faraboschi to Suzuki that will result in improved compression. The use of the control bits (such as the delimiter encoding bits) in Faraboschi allows, for instance, for a compacted instruction word to be stored across address boundaries [col. 6, lines 3-6], resulting in more efficient compression of those instructions. The use of dispersal bits also allows the compacted instructions to be quickly and easily forwarded to the appropriate functional unit without needing to decode the instruction. For at least these reasons, the addition of the techniques of Faraboschi to Suzuki would be obvious to a person having skill in the art.

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey S. Faherty whose telephone number is (571) 270-1319. The examiner can normally be reached on Monday-Thursday and every other Friday, 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eddie P Chan/
Supervisory Patent Examiner, Art Unit 2183

/Corey S Faherty/
Examiner, Art Unit 2183